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ABSTRACT

The goal of a project was to design, test, and evaluate several computer programs that allow students in introductory literature and poetry courses to explore a poem in detail and, through a dialogue with the program, to develop their own interpretation of it. Computer programs were completed on poems by Robert Frost and W.H. Auden. Both programs were tested, revised, and retested in classes at Kingsborough Community College, New York, and at other institutions. Preliminary versions of two more computer programs were produced--one on Gerard Manley Hopkins' "The Windhover" and one on elementary prosody. Feedback from students and faculty was overwhelmingly positive and was used to implement changes in the software. Statistical results were inconclusive, but seemed to indicate that those who benefited most from the programs were able to apply what they had learned to the study of another related poem. Appendixes contain information for the Fund for the Improvement of Postsecondary Education; statistical results of testing in year 1 and year 2; student questionnaires; a report by outside evaluator Dr. Mohamed Tazari; a grid used for programming; print-outs of student sessions; and a conference program. (RS)

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ED 415 515

Exploring Poetry Through Interactive Computer Programs

The goal of this project was to design, test and, evaluate several computer programs, which allow students in introductory literature and poetry courses to explore a poem in detail and, through a dialogue with program, to develop their own interpretation of it. We completed programs on poems by Frost and Auden, both of which were tested, revised, and retested in classes at Kingsborough and at other institutions. We also produced preliminary versions of two more programs: one on Hopkins' "The Windhover" and one on elementary prosody. Our experience during the project has demonstrated the effectiveness and potential of such software.

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Products:

Interactive Software (for IBM and compatible computers):

"Design" by Robert Frost
"Musée des Beaux Arts" by W. H. Auden
"The Windhover" by Gerard Manley Hopkins
"Poetry to the Ear" (excerpts)

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Cover Sheet

Grantee Organization:

Kingsborough Community College
of the City University of New York
Department of English
2001 Oriental Boulevard
Brooklyn, NY 11235

Grant Number:

P116B30482

Project Dates:

Starting Date: September 1, 1993
Ending Date: August 31, 1995
Number of Months: 24

Project Directors:

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Kingsborough Community College, CUNY
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FIPSE Program Officer: Brian Lekander

Grant Award: Year 1 $85,915.00
Year 2 $80,862.00
Total $166,777.00

Exploring Poetry Through Interactive Computer Programs
Kingsborough Community College of the City University of New York
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Brooklyn, NY 11235

Project Directors: Howard Nimchinsky and Jocelyn Camp
(718) 368-5939

Executive Summary

Project Overview

The purpose of our project was to design, test, and evaluate several distinct software programs, each on an individual poem. Each program would allow students in introductory literature and poetry courses to explore the poem in depth and develop an interpretation of it. With the help of a group of faculty, with whom we consulted throughout the project, we chose the poems to be used, and in the first year of the grant tested preliminary and revised versions of the first program, on Robert Frost's "Design," and completed the preliminary version of a second one, on W.H. Auden's "Musée des Beaux Arts." In the second year we presented our work at three conferences, tested and revised "Musée des Beaux Arts" extensively, continued planning and began the programming for two more programs (one on Gerard Manley Hopkins' "The Windhover," and one on elementary prosody) and hosted a conference on "Computers and the Humanities" at our college. Students at a community college and a senior college used the programs during the two years of the grant in a total of eighteen poetry or introductory literature courses, and several other classes served as control groups. Many suggestions made by these students and teachers were implemented in later versions of the programs, as well as those of an outside evaluator on educational software design.

Purpose

The problem our project addressed was the difficulty that students in introductory literature classes often have with close reading of poetry, and their reluctance to do so. Our goal was to emphasize close reading and analysis. During the course of the grant our understanding of the problem itself did not fundamentally change. In fact, the ways the students used the programs made us aware of reading difficulties we had not anticipated. The records of each use of the programs indicate how students go about reading and analyzing; this taught us more about their learning processes than we could have discovered through traditional classroom instruction. According to the data we collected, the programs we designed were for the most part successful in focusing attention on the language of the poems and allowing students to develop their own reasoned interpretations.

Any administrative pitfalls involved in using our software would have to do with providing the requisite technology to support it. Technology is developing and changing at such a rapid pace that both the software designer and the campus must constantly be prepared to adjust. The college must be responsible for keeping hardware up to date, an expensive proposition in days of tightened budgets. Teachers need some instruction as well, though the programs are really self-explanatory and "computer literacy" is not required.

Background and Origins

At Kingsborough, all English faculty teach developmental as well as literature courses. Our FIPSE project originally developed out of our work as reading teachers. In the late 1980's we designed a developmental reading exercise, programmed in Prolog, in which students would answer questions on a short passage of text and the computer would respond. With the help of a series of small grants we wrote five of these programs and used them in reading courses. We realized that the same basic techniques could be applied to literature, and determined to create several programs in the interpretation of poetry.

Support from the College has been essential to our work on the FIPSE grant. One necessity for the success of a project like ours is the cooperation of the academic computing staff of the college, which, for the most part, we had. They helped in setting up and supervising labs, giving us access to equipment (such as scanners), and allowing us to put updated versions of our programs on the network. The College provided computer and printer upgrades for the Project Directors' offices, access to the Toolbook hotline, and some travel funds. We were dependent upon our cooperating faculty from Kingsborough and other campuses as well, who tested the programs with their classes or served as controls and advised on design and revision.

Project Description

1993-1994

We assembled a group of faculty--poets and teachers of poetry-- to advise us. We worked out questions for and programmed a preliminary version of "Design" and tested it in three classes. We decided that "Musée des Beaux Arts" would be our second program, and began to collect material on it. Meanwhile, based on the students' answers in the preliminary version of "Design" we revised the questions and programmed the computer's responses to their answers,in a more complete version of the program. The procedure that we developed to do this--the conversion of the guided discussion of the poems into interpretive categories, on which the programming design can be based--constitutes one of the major outcomes of the project. In the Spring we tested "Design" in four classes and compared the results with two control classes. A summer school class at Kingsborough used a revised version of "Design." Preliminary programming was done on "Musée."

1994-1995

We finished the preliminary version of "Musée des Beaux Arts" and tested it in the Fall semester with six different classes, five at Kingsborough and one at New Jersey Institute of Technology. Two of the courses used "Design" as well. Since this was the preliminary version, we did not go through the same testing procedure as we had in the spring, but on the basis of students' answers and their suggestions, as well as the suggestions of the teachers, we revised the questions, and finally redesigned the entire format of the program. We discovered that, since each poem is unique, each demands its own approach to program style and programming technique. Accordingly, we developed an innovative method for using faculty and student input to determine programing design.

During the fall semester, we exhibited our work to date at a poster session at the FIPSE Project Directors' Meeting , did an hour-long presentation at the Annual Conference of the

League for Innovation in the Community College in Houston, and demonstrated our work at "Learning Technologies," a CUNY Faculty Senate conference.

In the Spring we tested the revised "Musée des Beaux Arts" in three Kingsborough classes. We also worked with our faculty group to revise the database for "Design" and to work out questions for "The Windhover." Because this is such a complex and multi-layered poem, making up even the preliminary version of the questions was difficult. We began work on a program dealing with prosody and the sonnet form, called "Poetry to the Ear." In May, we sponsored a day-long conference at our College, "Computers and the Humanities," with presentations by a number of academic software designers within CUNY and in other colleges in the region, including ourselves.

During the summer, after further revision, we tested "Musée" with students again and worked with our outside evaluator, Mr. Mohamed Tazari. We traveled to the University of Virginia to visit the IATH (Institute for Advanced Technology in the Humanities), and in August, Project Director Nimchinsky attended the AACE (Association for the Advancement of Computing in Education) World Conference on Artificial Intelligence in Education in Washington, DC. Programming of the preliminary versions of "Poetry to the Ear" and "The Windhover" continued throughout the summer.

Evaluation/ Project Results

We used several methods of evaluation throughout the project: we compared the work of students who used the programs with that of control groups; we asked students to fill out a questionnaire after each use of the software, including their suggestions for improvement; we included files at the end of the programs which gave us valuable records of how the programs were used; we consulted often with our faculty group; we consulted an outside evaluator. Feedback from students and faculty was overwhelmingly positive and very useful in that we were able to implement many of their suggestions. Statistical results were inconclusive, but seemed to indicate that those who benefited most from the programs were able to apply what they had learned to the study of another related poem. The two-year time limit of the grant meant that it was impossible to both create the programs and test them with large enough groups to obtain meaningful statistical results.

We are continuing the project. At present, we are testing the preliminary "Windhover" and creating the preliminary version of "Poetry to the Ear." We do intend to complete both of these programs and to test them with students at Kingsborough and at other campuses whenever possible. We continue to test and revise the earlier programs. In addition, we hope to extend the current project next year by creating a CD-ROM on several poems of the Romantic period, with the help of scholars in the field. We are currently seeking funding for this endeavor. In the meantime, we are ready to approach publishers with the first three programs.

Summary and Conclusions

Despite the fact that each program took longer to develop and test than we had expected, and that rapidly changing technology meant that we had to constantly rethink and redesign, we believe our project was successful. We completed fewer programs than we had projected, but the software we did design was much more sophisticated and complex and contained many more features than we had originally planned.

Cover Sheet

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2001 Oriental Boulevard
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Exploring Poetry Through Interactive Computer Programs

Kingsborough Community College of the City University of New York
2001 Oriental Boulevard
Brooklyn, NY 11235

Project Directors: Howard Nimchinsky and Jocelyn Camp
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Final Report

Project Overview

The purpose of our project was to design, test, and evaluate several distinct software programs, each on an individual poem. Each program would allow students in introductory literature and poetry courses to explore the poem in depth and develop an interpretation of it. With the help of a group of faculty, with whom we consulted throughout the project, we chose the poems to be used, and in the first year of the grant tested preliminary and revised versions of the first program, on Robert Frost's "Design," and completed the preliminary version of a second one, on W.H. Auden's "Musée des Beaux Arts." In the second year, we presented our work at three conferences, tested and revised "Musée des Beaux Arts" extensively, continued planning and began the programming for two more programs (one on Gerard Manley Hopkins' "The Windhover," and one on elementary prosody, called "Poetry to the Ear") and hosted a conference on "Computers and the Humanities" at our college. Students at a community college and a senior college used the programs during the two years of the grant in a total of eighteen poetry or introductory literature courses, and several other classes served as control groups. Many suggestions made by these students and teachers were implemented in later versions of the programs, as well as those of an outside evaluator on educational software design.

Purpose

The problem our project addressed was the difficulty that students in introductory literature classes often have with close reading of poetry, and their reluctance to do so. Our goal was to emphasize close reading and analysis. During the course of the grant, our understanding of the problem itself did not fundamentally change. In fact, the ways the students used the programs made us aware of reading difficulties we had not anticipated. The records of each use of the programs indicate how students go about reading and analyzing; this taught us more about their learning processes than we could have discovered through traditional classroom instruction (see "Evaluation" below for a description of these records.) The greatest problem many of them have, we found, was in putting together the pieces of information they had learned into a coherent overall interpretation. According to the data we collected, the programs were for the most part successful in focusing attention on the language of the poems and allowing students to do very detailed close reading. The specific questions they were asked to answer encouraged this, and the nature of the computer itself commands concentration. Certainly most students enjoyed using the programs. They particularly liked the ease with which they could access information about individual words and concepts. They could work at their own speed, and this varied greatly from student to student.

Any administrative pitfalls involved in using our software would have to do with providing the requisite technology to support it. Technology is developing and changing at such a rapid pace that both the software designer and the campus must constantly be prepared to adjust. The college must be responsible for keeping hardware up to date, an expensive proposition in days of tightened budgets. College technicians must be on hand for the multitudinous things that can go

wrong with the equipment. Teachers (especially those who are unaccustomed to using computers with their classes) need some instruction in using the software, though the programs are really self-explanatory and "computer literacy" is not required.

Those who embark on software development themselves will learn, as we did, that everything takes longer than expected; equipment breaks down, unforeseen bugs occur, viruses appear. Constant adjustments have to be made as one perceives how the programs are actually used. For example, we discovered that each poem requires an entirely different approach and that we could not simply copy the procedures we had already worked out. New developments in technology allow for more and more sophisticated design and more and more possibilities, but with each new invention adjustments in the plans have to be made. These are exciting times for software development, but the speed of change in the field requires that expectations must undergo constant revision.

An exciting outcome of our project was the unanticipated development of a method of programming complex relationships through the input of faculty participants. Originally, we ourselves determined the possible interpretations of a poem and decided how the students' understanding of individual parts of the poem might fit into those interpretations. We found that the program based on our judgments was to some extent faulty, chiefly in the appropriateness of some of the comments the program made on the students' answers. When we met with our faculty participants, we realized that they brought to the poem in question a wider range of understanding than we had originally conceived. We assigned them the task of developing a list of possible interpretations of the poem as a whole. They discussed the lists submitted by each of them at the meetings we held regularly, and, under Dr. Camp's guidance, they ultimately reached a

consensus. We then designed a grid which the group would use to indicate what readings of parts of the poem were to be judged consistent or inconsistent with the various interpretations. (Please see Appendix E.)

After we administered the preliminary version of the program to the classes using it, we asked the group to categorize the answers that students gave to specific questions, each expressed by the students in their own way. Once the categories were formulated, we distributed the grid to the participating faculty. On it, each teacher was to indicate the relationship between a category of answer and the interpretations agreed on earlier. Once the grids were completed, discussed by the group at large, and merged, Dr. Nimchinsky was able to use the resulting master grid to create the database of responses and to modify the programming design. This method made it possible for the program to respond to the answers which the students give in their own words and to judge the internal consistency of their replies.

What we have described may seem a well thought out and organized approach to creating a program dealing with text, and that is indeed what it turned out to be. In its development, however, it evolved in stages that we at first did not notice or appreciate. Eventually, it became clear that we had hit upon an extremely effective methodology for dealing with textual analysis and interpretation. Moreover, we learned from this process that there are no short-cuts to developing this type of software, that neither the programmer's or the scholar's ivory tower provides a good vantage point for dealing with the reactions of others--especially students. We feel at this point that, in the future, we can 1) teach our approach to other teachers and programmers, and 2) extend this methodology to other fields in which the interpretation of texts is crucial. In the meantime, we are eager to apply our method to other poetic works.

Background and Origins

At Kingsborough, all English faculty teach developmental as well as literature courses. Our FIPSE project originally developed out of our work as reading teachers. In the late 1980's we designed a developmental reading exercise, programmed in Prolog, in which students would answer questions on a short passage of text and the computer would respond. With the help of a series of small grants we wrote five of these programs and used them in reading courses. We realized that the same basic techniques could be applied to literature, and determined to create several programs in the interpretation of poetry.

Support from the College has been essential to our work on the FIPSE grant. One necessity for the success of a project like ours is the cooperation of the academic computing staff of the college, which, for the most part, we had. Since we used the software in the College's computer labs, their help was essential in setting up and supervising labs. They also gave us access to equipment (such as scanners), and allowed us to put updated versions of our programs on the network. The College provided computer and printer upgrades for the Project Directors' offices, access to the Toolbook hotline, and some travel funds. We were dependent upon our cooperating faculty from Kingsborough and other campuses as well, who tested the programs with their classes or served as controls and advised on design and revision.

Project Description

The format of the software, programmed in *Toolbook* and *Prolog*, is as follows: students are presented with a copy of the poem on screen, and may access information about the author, the date of publication, definitions of the words in the poem, and other background information

by clicking on "hotwords." They may also hear it read aloud and, in the case of "The Windhover," see a video of the bird of the title in flight. When they are ready, they write in answers to a series of questions on the poem aimed at preparing them to write an overall interpretation. Questions are not judged right or wrong, but in "Design" the program "reads" their answers and asks if it has read them accurately. If the program cannot understand an answer, it offers a number of possibilities and asks students which they agree with and which they do not. The program also keeps track of the answers and checks the consistency of the interpretation, as measured against several different ways of reading the poem. In "Musée des Beaux Arts," there is quite a bit more background information, as the purpose of the program is to teach the importance of understanding allusions in poetry. Students can see the paintings referred to in the poem and read the story of Daedalus and Icarus. They write a preliminary interpretation, before they study the background information, and can compare it side by side with the interpretation they write at the end. Unlike "Design," which is a poem that can be read several different ways, depending upon how one interprets the images in the poem, "Musée" is relatively unambiguous; hence the consistency check is unnecessary. "The Windhover," which will eventually be the most complex of the programs, contains features of both. It is in the process of initial testing with students; the computer's replies to their answers cannot be programmed until we discover what they actually will write. "Poetry to the Ear" is a series of interactive exercises and is completely different from the other programs, but will be used as a supplement to them.

We include several files at the end of the programs which provide information about how the programs were used by the students. These are described below, on page 9. Additional files enable the program to return the students to the program for additional sessions preserving all the

conditions which obtained at the time they last left the program. This "bookmark" feature is indispensable when the students are using the program on a local area network, since the program itself cannot be modified. Likewise, at such time as we may include these programs on a CD-ROM, it will be impossible to create a bookmark, except through external files.

Project Activities

1993-1994

As the grant began we assembled a group of faculty--poets and teachers of poetry--to advise us. We worked out questions for and programmed a preliminary version of "Design" and tested it in three classes. The faculty group met to discuss poems to be chosen for the next program. We decided on "Musée des Beaux Arts," and began to collect material on it. Meanwhile, based on the students' answers in the preliminary version of "Design" we revised the questions and programmed the computer's responses to their answers, in a more complete version of the program.

In the Spring semester we tested "Design" in four classes (three at Kingsborough and one at New Jersey Institute of Technology) and compared the results with two control classes (one at Kingsborough and one at Brooklyn College). (Please see *Evaluation/Project Results* below for a description of the testing process and results.) A summer school class at Kingsborough used a revised version of "Design." Preliminary programming was done on "Musée."

1994-1995

We finished the preliminary version of "Musée des Beaux Arts" and tested it in the Fall semester with six different classes, five at Kingsborough and one at New Jersey Institute of Technology. Two of the courses used "Design" as well. Since this was the preliminary version, we did not go through the same testing procedure as we had in the spring, but on the basis of students' answers and their suggestions, as well as the suggestions of the teachers, we revised the questions, eliminating the ones that didn't work, and finally redesigned the entire format of the program, making it possible for users to access the questions from the main screen, answer the questions in any order, and revise any answer at any time. We discovered that, since each poem is unique, each demands its own approach to program style and programming technique.

Also during the fall semester, we exhibited our work to date at a poster session at the FIPSE Project Directors' Meeting , and did an hour-long presentation at the Annual Conference of the League for Innovation in the Community College in Houston. FIPSE grantee Dean Savage, who had seen our poster session at the FIPSE meeting, invited us to demonstrate our work at "Learning Technologies," a CUNY Faculty Senate conference held in December.

In the Spring we tested the revised "Musée des Beaux Arts" with three Kingsborough classes, two of which were Introduction to Literature courses and one of which was an Introduction to Poetry course. (See *Evaluation/ Project Results)* Our Program Officer, Brian Lekander visited and observed Dr. Camp's poetry class. As luck would have it, all the students' disks had been infected by a virus and they were unable to use the program that day. (They wrote their first interpretations on paper while Brian looked at the program on a separate computer).

Also during the Spring semester we worked with our faculty group to revise the database for "Design" and to work out questions for "The Windhover." Because this is such a complex and multi-layered poem, making up even the preliminary version of the questions was difficult. We began designing a program dealing with prosody and the sonnet form. In May, we sponsored a day-long conference at our College, "Computers and the Humanities," with presentations by a number of academic software designers within CUNY and in other colleges in the region, including ourselves. Among the presenters were FIPSE grantees Paula Berggren and David Stephan. Bret Eynon of the "Who Built America" project was the keynote speaker. (Please see Appendix G for Conference program). We were visited in June by a group of Swedish foreign language professors from Malardalen University College who were touring some colleges and universities in the United States through the United States Information Agency. We showed them our college's computer facilities and demonstrated "Musée" and an ESL program developed by another Kingsborough faculty member (Cindy Greenberg--once a FIPSE grantee).

During the summer, after further revision, we tested "Musée" with students again and worked with our outside evaluator, Mr. Mohamed Tazari. Mr. Tazari met with us several times and attended Dr. Nimchinsky's Introduction to Literature class twice to observe their use of the program. He made a number of suggestions on program design, most of which we were able to implement. (Please see below, *Evaluation/Project Results*, and see Appendix D for Mr. Tazari's report).

We traveled to the University of Virginia to visit the IATH (Institute for Advanced Technology in the Humanities) in late June where we met with the Director, John Unsworth, Romantic scholar Jerome McGann, and the head of the Electronic Text Center, David Seaman. It

was a very productive trip. We learned at great deal and found the IATH to be a dynamic and exciting place. Especially enlightening was what we found out about the extensive electronic archives of literary and historical texts and graphics which they are busily assembling in several fields. We intend to make use of them and similar material collected at other universities in developing new programs. We were also made aware of the utility of the World-Wide Web as both a resource and a vehicle for our programs.

In August, Project Director Nimchinsky attended the AACE (Association for the Advancement of Computing in Education) World Conference on Artificial Intelligence in Education, "AI-ED '95" in Washington, DC. At this conference, he learned about the use of Intelligent Tutoring Systems (ITS's) in the development of training programs. He saw that the technique was applicable to the kind of programs we are creating, especially those which deal with complex poetic texts. A logical extension of the approach we have used so far, the ITS teaches content and the skills needed to master that content at the same time.

Programming of the preliminary versions of "Poetry to the Ear" and "The Windhover" continued throughout the summer. "The Windhover" design is different from that of the previous programs, in that there are many more questions, divided into categories. Users click on icons on the main screen to access questions in the four groups ("Events," "Ideas," "Imagery," and "Form"). We also obtained a video from a bird photographer of a kestrel flying, which we incorporated into the program. "Poetry to the Ear" is a series of interactive exercises. We are beginning with sonnet form, since both "Design" and "The Windhover" are sonnets.

Evaluation / Project Results

We used several methods of evaluation throughout the project.

1. We asked students to fill out two kinds of questionnaires. One gave us information about students' previous English courses, what their reading habits were for poetry and in general, and how they perceived themselves as computer users. (Control groups answered the same questionnaire, minus the computer use question). Also, after each use of the software, we asked for their reactions, including what they liked best and least about the programs, their opinions of how clear the instructions were, information about how much they felt they had learned, and their suggestions for improvement. (Please see Appendix C.) The suggestions were extremely useful and we were able to incorporate many of them in revised versions of the programs. For example, students wanted to be able to go back and revise answers, and access questions directly from the main screen. We were able to allow for this in later versions. One of our faculty group suggested that students write "before and after" versions of their interpretations of "Musée," one before they had read the background material and one after so that we could compare results, and we added this feature.

2. We tested students who used the programs and control groups. Three Kingsborough classes and one class at NJIT used "Design" in the spring of 1994. Two control classes were taught the poem without using the computer program, one at Kingsborough and one at Brooklyn College. All classes were asked to write on a follow-up poem with some similarities to "Design," Emily Dickinson's "Apparently with no surprise..." (The faculty group decided on this poem after long discussion and made up

the test.) Students were to make up study questions on the Dickinson poem before writing about it in class. The papers (the test on "Design," the study questions on "Apparently..." and the test on "Apparently...") were marked by several independent graders. Test results were inconclusive. Senior college students did better than community college students whether using the computer programs or not. However, those who used the computer program and did well on it were more likely to make up better questions on the Dickinson poem than those who did not use the programs. This seemed to indicate that those who benefited most from the programs were able to apply what they had learned to the study of another related poem. (Please see Appendix B for statistical results.)

In the Spring 1995 semester, we tested "Musée des Beaux Arts." Three sections at Kingsborough (two in Intro. to Lit. and one in Poetry) used the program, and an Intro. to Lit. class at Kingsborough and a similar introductory literature class at LaGuardia Community College, CUNY served as our control groups. These students wrote a brief interpretation of the poem before studying it in class and another afterwards. Their papers were mixed with before-and-after interpretations written by students who used the programs and all were graded by a group of outside graders. Results, examined by our college statistician, showed that computer users' first essays were not as good as the ones in the control classes, but that in the end all students arrived at the same place. (Please see Appendix B.)

Because we had made a number of changes in the program, we tested it again in the summer with an Introduction to Literature class and used another section of the course

as a control group. The results of this testing, graded in the same manner as were the papers in the spring, showed that the experimental group did slightly better than the control group. However, the sample was probably too small to prove very much.

3. We include several files at the end of the programs which give us valuable information about how the programs were used by the students. These give us insight into how they work with the software and also into their reading processes. One file keeps a chronological record of the students' sessions with the program. The time the students spend in each session is noted; each hotword which they consult, as well as the questions they attempt and their answers, are recorded in the order they followed. For instance, we can see how many times they go back to revise answers (along with all the versions of the answers) and understand, in many cases, reasons why the students adopt a particular strategy for exploring the program and the poem. Another file lists all the questions in numerical order and includes all the students' answers to a particular question immediately after the text of that question. Also included in this file are the interpretive essays which the program calls upon the students to write. This is the file which is printed out for the students, who thereby get an enhanced perspective on their work. (See Appendix F for the logs of one student's session with "Musée des Beaux Arts.")

4. We asked an outside evaluator, Dr. Mohamed Tazari, to evaluate "Musée des Beaux Arts." Currently an Adjunct Professor of French at the College of Staten Island, Dr. Tazari is the developer of an interactive multimedia software program entitled "French Interactive." This was his dissertation project for his degree in Instructional Technology and Media in Education at Teachers College, Columbia University. He has also served as

Multimedia Coordinator at Teachers College, in charge of setting up and running a multimedia laboratory. He met with us in the summer of 1995, observed the students using the program, and made a number of suggestions for improvement. Most of these suggestions, having to do with making the program easier to use (the addition of a help screen, more efficient way of dismissing 'hotwords," etc.) we incorporated into "Musée" and will employ in future programs. (His report is included in Appendix D)

5. In addition to the formal procedures described earlier in *Purpose*, we consulted often with our faculty group who were both advisors and testers of the programs with their classes. They created some of the questions for the programs, suggested design features, and offered numerous insights both on interpretation of the poems and pedagogy.

Overall, feedback from students and faculty was overwhelmingly positive and very useful in that we were able to implement many of their suggestions. Statistical results, though favorable, were inconclusive. Although we tried to test in a way that would yield valuable data, we don't believe that the results we have so far are really significant. There are several reasons for this. One is that we had to learn how to set up the test. In the first year, we were not clear enough in our instructions to the teachers, and some of them used the test on "Design" as a final exam while others used it as a class exercise. More important was the fact that the programs were in the process of development while we were testing them. Student input was invaluable, but evaluating for statistical results was premature. We really needed a third year on the grant in order to do this properly. Essentially, we found that we were trying to perform too many different kinds of tasks at the same time, especially since we did not use a separate computer programmer and all actual programming was done by Project Director Nimchinsky.

We are continuing the project. At present, we are testing the preliminary "Windhover" and creating the preliminary version of "Poetry to the Ear." We do intend to complete both of these programs and to test them with students at Kingsborough and at other campuses whenever possible. We continue to test and revise the earlier programs. In addition, we hope to extend the current project next year by creating a CD-ROM on several poems of the Romantic period, with the help of scholars in the field. We are currently seeking funding for this endeavor. In the meantime, we are ready to approach publishers with the first three programs.

Summary and Conclusions

Despite the fact that each program took longer to develop and test than we had expected, and that rapidly changing technology meant that we had to constantly rethink and redesign, we believe our project was successful. We completed fewer programs than we had projected, and our aims were revised somewhat. For example, we had initially planned to make the programs available for Apple as well as IBM computers. However, since advances in technology now make it possible to convert form one to the other, we felt our time was best spent continuing to work within the IBM platform. The software we did design was much more sophisticated and complex and contained many more features than we had originally planned. We believe that the project demonstrated the effectiveness and potential for such software.

APPENDICES

A. Information for FIPSE

B. Statistical Results of Testing: Year 1, Year 2

C. Student Questionnaires

D. Report by Outside Evaluator, Dr. Mohamed Tazari

E. Grid Used for Programming

F. Print-outs of Student Sessions

G. Conference Program

H. Software: *Design, Musée des Beaux Arts, The Windhover, Poetry to the Ear*

Appendix A

Information for FIPSE

One of the things we liked best about the way FIPSE operates is that you were always accessible to us and willing to help. Both Brain Lekander and Dora Marcus gave us advice and direction and answers to our numerous questions throughout the period of our grant. At the same time, we felt that FIPSE believed in what we were doing and that we were trusted to proceed as we best saw fit. In other words, no one was constantly looking over our shoulders, and yet, your oversight was uniformly helpful, and assistance and encouragement were there when we needed them.

Our only suggestion has to do with the Project Directors' Meeting. We enjoyed both conferences we attended very much. We learned a great deal, both about the work being done on other grants, and also on how other grantees had proceeded to implement and evaluate their work. We would have liked to have gone this year too! Our suggestion is that there might be some way to include ex-grantees in the Project Directors' Meeting--and/or perhaps they could meet as a separate group to discuss life after FIPSE. As we determine where to go with our work now that the grant is finished, the advice and suggestions of other people at the same stage would be very helpful.

We definitely encourage FIPSE to fund other software development projects in the Humanities. Intelligent programs are just now beginning to take advantage of the technological possibilities that are now available. At this point, colleges and universities are still unsure if such work merits serious consideration as "scholarship" and tend not to include it in tenure and promotion considerations. Therefore, faculty who already have tenure and rank (for example, the two of us, Stuart Curran at Penn., Jerome McGann at UVa) are the only ones who dare pursue it. This attitude will probably change, especially since there is such an educational necessity for such projects. In the meantime, encouragement and funding by FIPSE can be a major factor in altering the landscape of academia to include opportunities and rewards for innovations in education using new technologies.

Appendix B

Statistical Results of Testing

In the following pages, the reports on the testing of Spring 1994, Spring 1995, and Summer 1995 precede the data concerning student profiles.

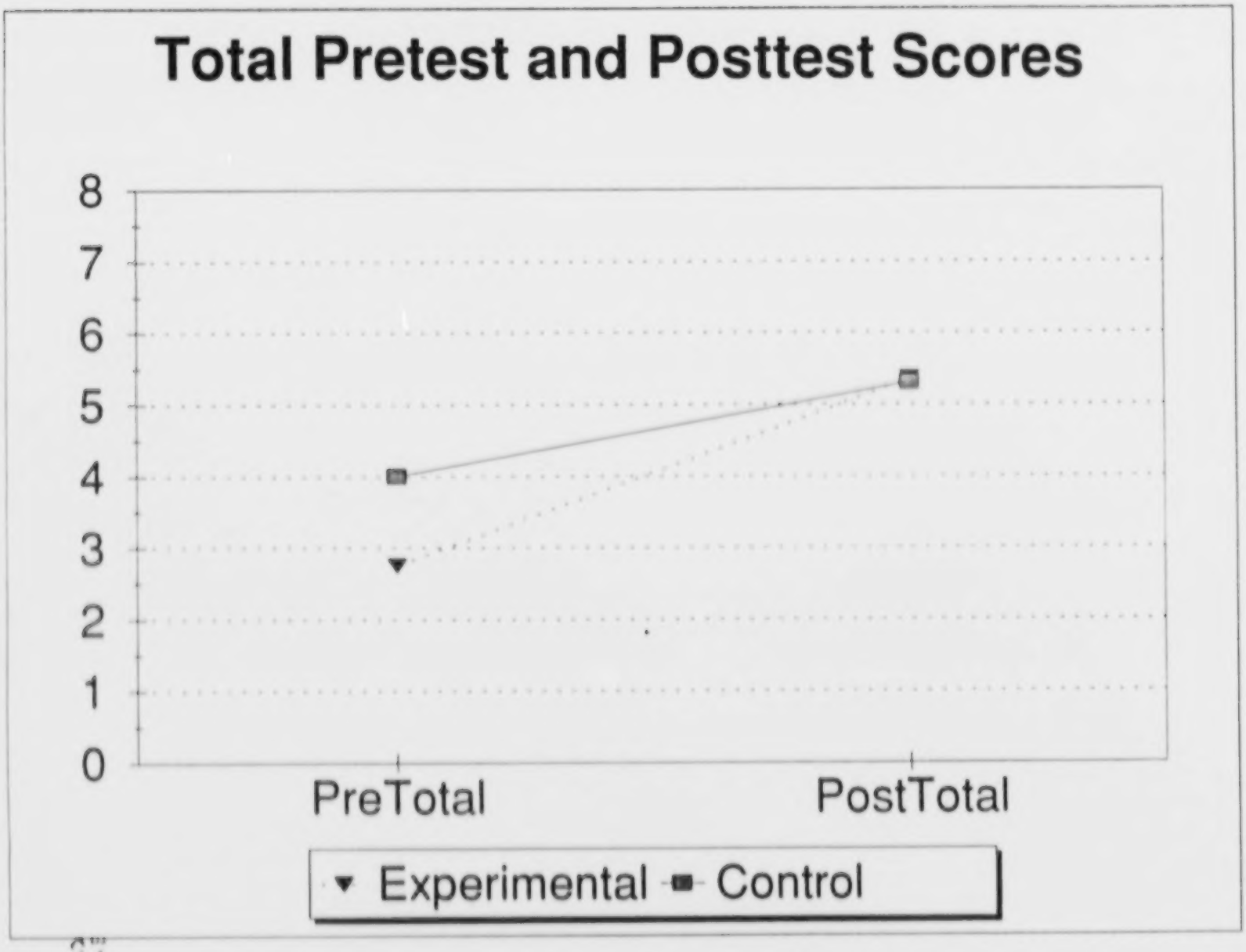
In the test report for Spring 1994, Score 1 designates the essay test on the poem "Design." Score 2 refers to an essay test on a related poem. Score Q is the evaluation of the students' attempts to generate questions on the latter poem.

In Spring 1995, the designations Pre1, Pre2, Post1, and Post2 refer to the scores assigned by first and second readers to the interpretations which the students wrote about the Auden poem before and after studying the poem, the experimental group through the program and the control with their teachers.

Spring Semester 1994

		Score 1		Score 2		Score Q	
	N	Mean	s.d.	Mean	s.d.	Mean	s.d.
Experimental	98	8.88	5.57	10.53	6.38	8.32	7.55
Control	56	10.77	5.63	9.96	7.01	5.77	6.18
t (df=152)		2.01		0.51		2.16	
p		p < .05		p > .05		p < .05	

Summer 1995 5/95



27

28

Spring 1995

CTR0EXP1

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	0	42	44.7	44.7	44.7
	1	52	55.3	55.3	100.0
	Total	94	100.0	100.0	

Valid cases 94 Missing cases 0

Number of valid observations (listwise) = 94.00

Variable	Mean	Std Dev	Minimum	Maximum	Valid N	Label
PRE1	1.60	.81	1	4	94	
PRE2	1.71	.82	1	4	94	
POST1	2.65	.95	1	4	94	
POST2	2.68	.93	1	4	94	

Number of valid observations (listwise) = 94.00

Variable	Mean	Std Dev	Minimum	Maximum	Valid N	Label
PRETOT	3.31	1.49	2.00	8.00	94	
POSTOT	5.33	1.72	2.00	8.00	94	

GAIN

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	-2.00	1	1.1	1.1	1.1
	-1.00	4	4.3	4.3	5.3
	.00	16	17.0	17.0	22.3
	1.00	13	13.8	13.8	36.2
	2.00	22	23.4	23.4	59.6
	3.00	20	21.3	21.3	80.9
	4.00	12	12.8	12.8	93.6
	5.00	5	5.3	5.3	98.9
	6.00	1	1.1	1.1	100.0
	Total	94	100.0	100.0	

Valid cases 94 Missing cases 0

t-tests for independent samples of CTR0EXP1

Variable	Number of Cases	Mean	SD	SE of Mean
GAIN				
CTR0EXP1 0	42	1.3571	1.527	.236
CTR0EXP1 1	52	2.5577	1.589	.220

Mean Difference = -1.2005

Levene's Test for Equality of Variances: F= .001 P= .978

Spring 1995

Variances	t-test for Equality of Means t-value	df	2-Tail Sig	SE of Diff	95% CI for Diff
Equal	-3.70	92	.000	.324	(-1.844, -.557)
Unequal	-3.72	89.22	.000	.323	(-1.842, -.559)

- - Description of Subpopulations - -

Summaries of PRETOT
By levels of CTR0EXP1

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			3.3085	1.4885	94
CTR0EXP1	0		4.0000	1.6965	42
CTR0EXP1	1		2.7500	1.0073	52

Total Cases = 94

- - Description of Subpopulations - -

Summaries of POSTOT
By levels of CTR0EXP1

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			5.3298	1.7189	94
CTR0EXP1	0		5.3571	1.6795	42
CTR0EXP1	1		5.3077	1.7661	52

Total Cases = 94

- - Description of Subpopulations - -

Summaries of GAIN
By levels of CTR0EXP1

Variable	Value	Label	Mean	Std Dev	Cases
For Entire Population			2.0213	1.6655	94
CTR0EXP1	0		1.3571	1.5273	42
CTR0EXP1	1		2.5577	1.5893	52

Total Cases = 94

Summer Semester 1995

	Prescore Total			Postscore Total		Gain	
	N	Mean	s.d.	Mean	s.d.	Mean	s.d.
Experimental	22	1.63	0.62	2.59	0.73	0.96	0.84
Control	24	1.60	0.57	2.44	0.77	0.84	0.55
t (df = 44)						0.58	
p						p > .05	

1994

Means for Different Levels of Experience with Computers, Remediation, and Having Literature Courses

		Means					
		Score 1		Score 2		Score Q	
	N	Mean	S.D.	Mean	S.D.	Mean	S.D.
Experience With Computer							
A	2	8.00	4.24	4.5	6.36	8.00	11.31
B	27	10.85	5.57	12.11	6.07	10.19	7.15
C	23	9.78	5.88	12.39	5.69	10.22	7.59
D	18	9.11	5.14	12.22	5.31	10.06	7.00
E	49	10.82	5.49	10.74	6.30	6.08	6.43
Analysis of Variance *d.f.*		*F*	*p*	*F*	*p*	*F*	*p*
1,114		*0.52*	*>.05 (NS)*	*1.14*	*>.05 (NS)*	*2.44*	*=.0508*
Remediation							
0	3	11.67	4.04	16.33	2.08	16.67	0.58
1	62	11.71	5.62	11.83	6.32	7.98	7.48
2	54	8.64	4.98	10.83	5.70	8.52	6.71
Analysis of Variance *d.f.*		*F*	*p*	*F*	*p*	*F*	*p*
2,116		*4.89*	*<.01*	*1.40*	*>.05 (NS)*	*2.16*	*>.05 (NS)*
Having Literature Courses							
0	92	9.52	5.75	9.43	6.75	5.78	6.89
1	48	9.67	5.00	11.33	6.15	9.98	6.54
2	11	8.00	7.38	13.18	5.86	10.55	8.51
3	2	15.00	5.66	8.00	11.31	0.00	0.00
4	1	15.00	..	17.00	..	12.00	..
Analysis of Variance *d.f.*		*F*	*p*	*F*	*p*	*F*	*p*
4,149		*0.91*	*>.05 (NS)*	*1.55*	*>.05 (NS)*	*4.21*	*<.01*
Total	154*	9.56	5.65	10.32	6.60	7.40	7.17

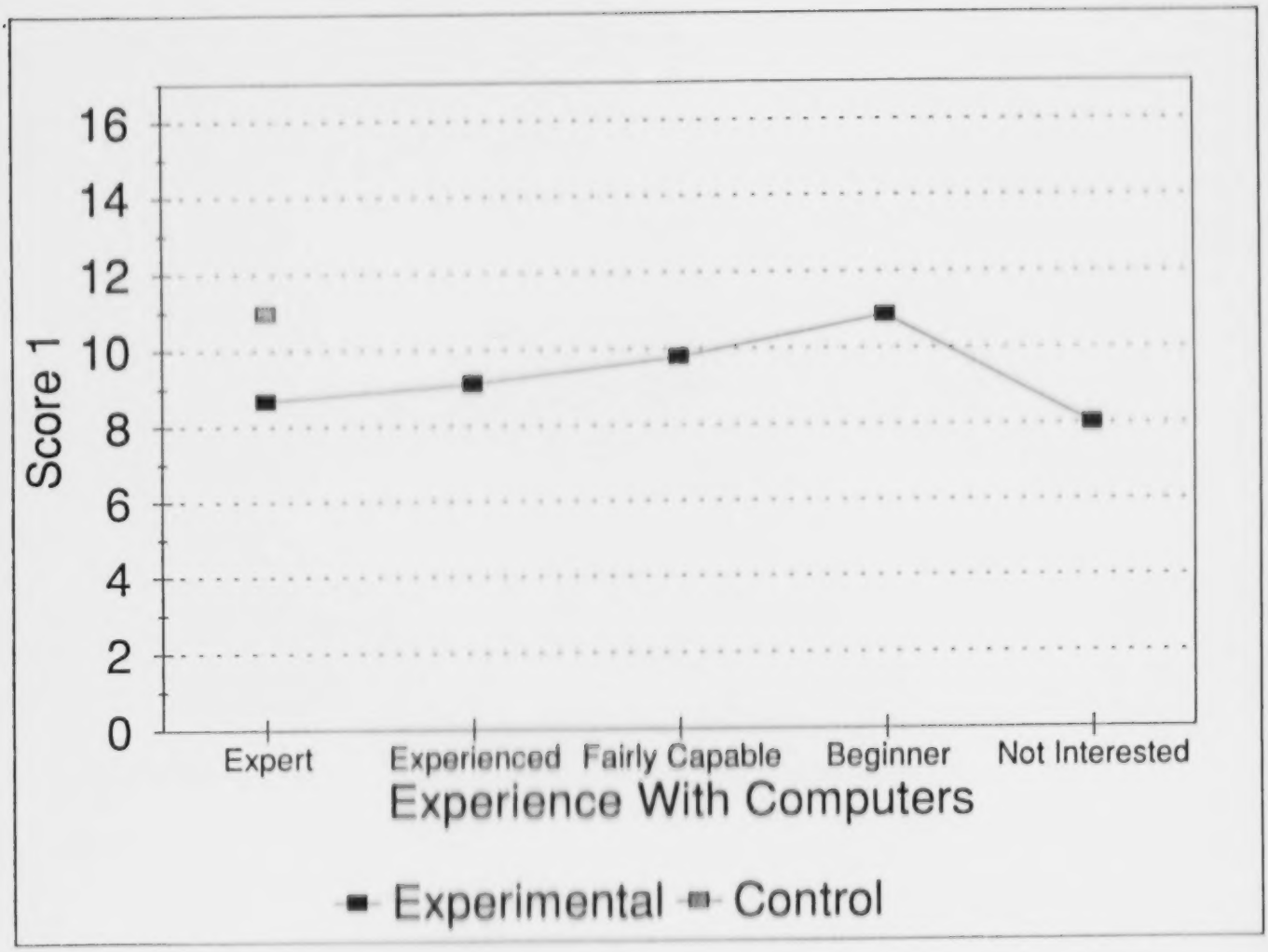
*All variables are not present for every case

1994

Means for Different Levels of Experience with Computers
by Experimental and Control Groups

Experience with Computer	Score 1 Experimental	Score 1 Control	Score 2 Experimental	Score 2 Control	Score Q Experimental	Score Q Control	Cell Sizes Experimental	Cell Sizes Control
Expert	8.67	10.96	9.67	10.80	6.33	6.07	3	46
Experienced	9.11	..	12.22	..	10.06	..	18	0
Fairly Capable	9.78	..	12.39	..	10.22	..	23	0
Beginner	10.85	..	12.11	..	10.19	..	27	0
Not Interested	8.00	..	4.50	..	8.00	..	2	0

Analysis of Variance	F	Sig of F	F	Sig of F	F	Sig of F
Experience with Computer	0.52	0.72	11.14	0.34	2.42	0.05
Experimental Group	0.48	0.49	0.10	0.75	0.01	0.95
Total Explained by Model	0.51	0.77	0.93	0.47	0.19	0.94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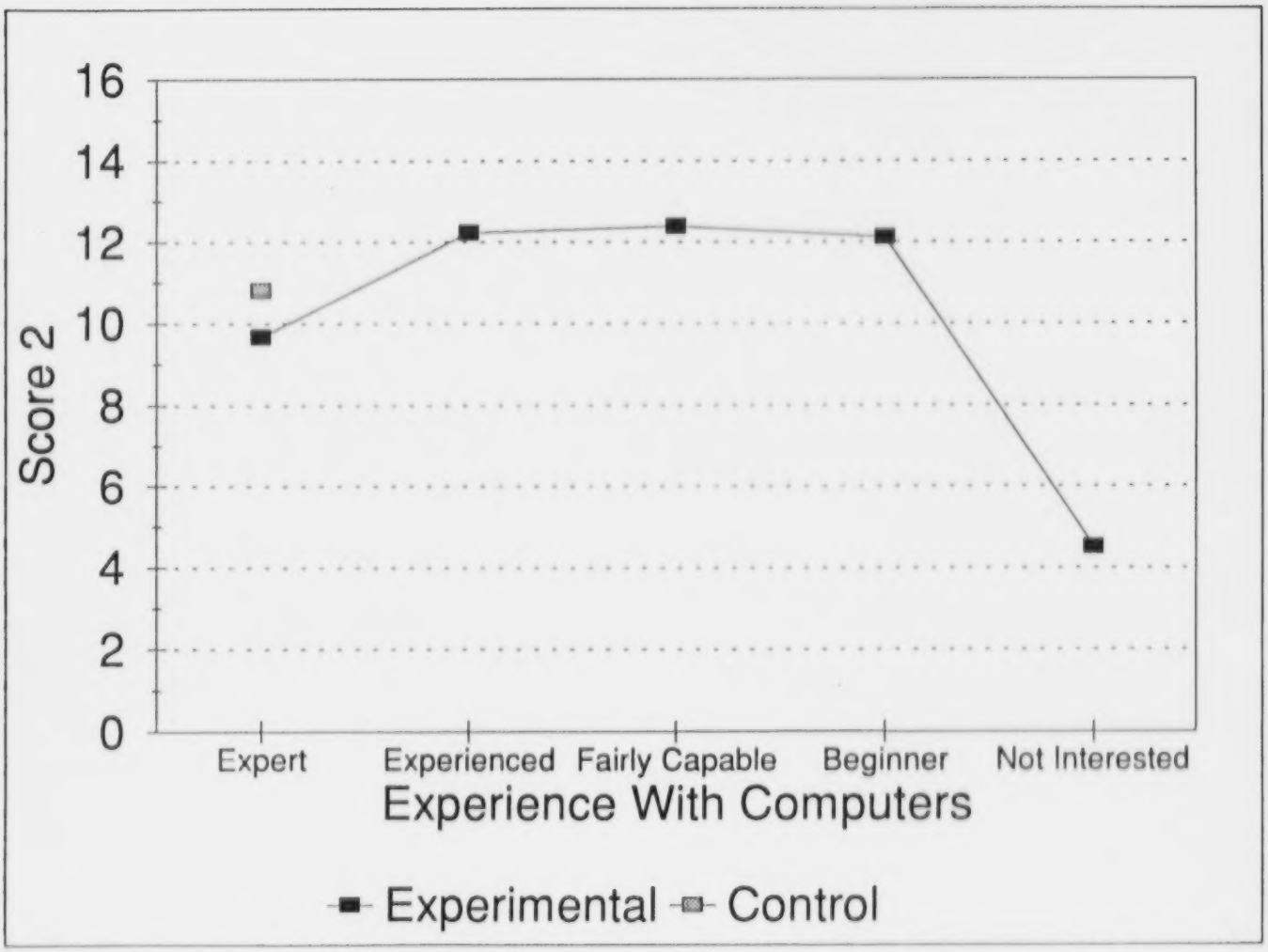
Expert
Experienced
Fairly Capable
Beginner
Not Interested
Experience With Computers
Experimental
Control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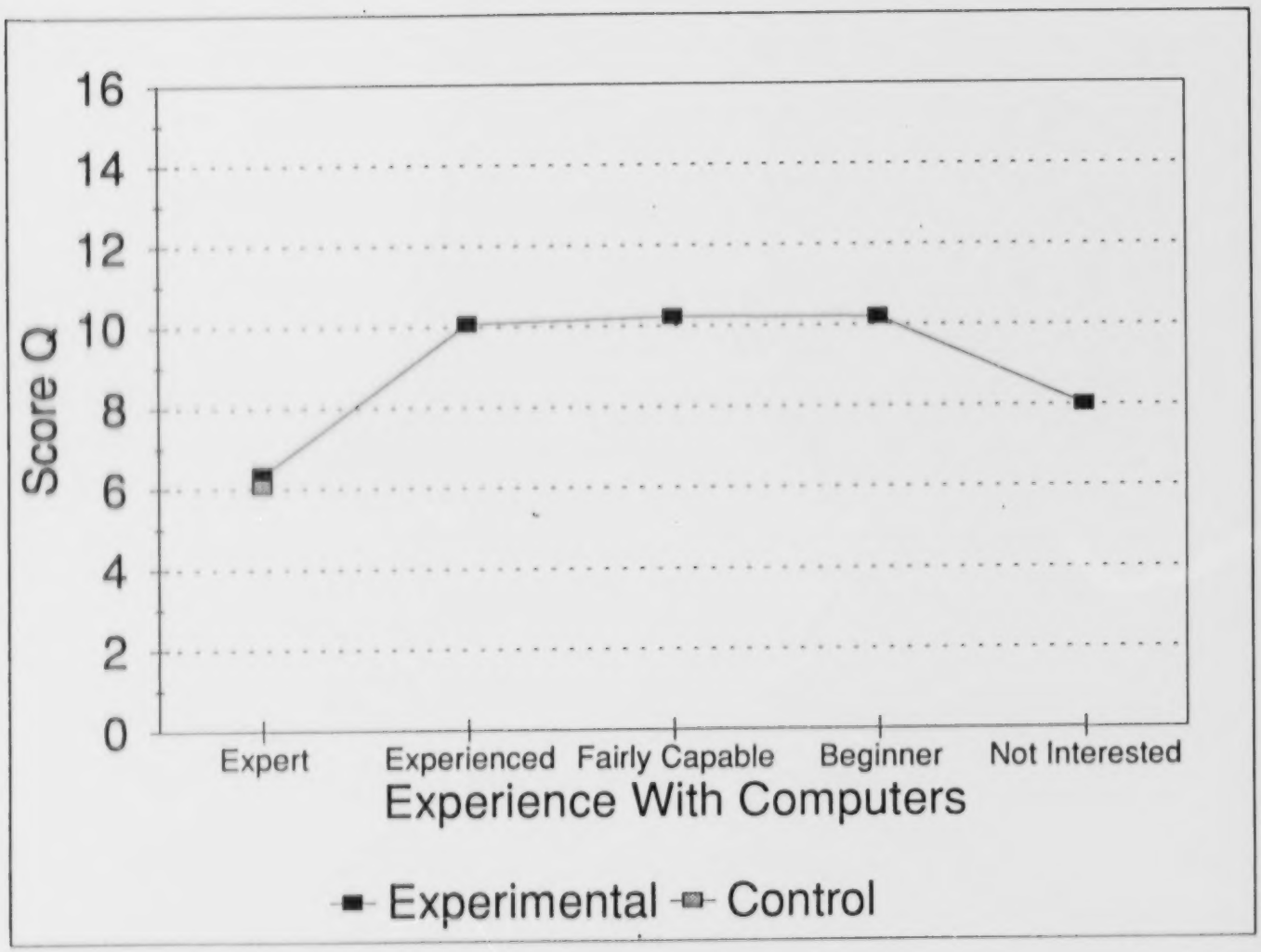
Experienced
Fairly Capable
Beginner
Not Interested
Experience With Computers
Experimental
Control


16
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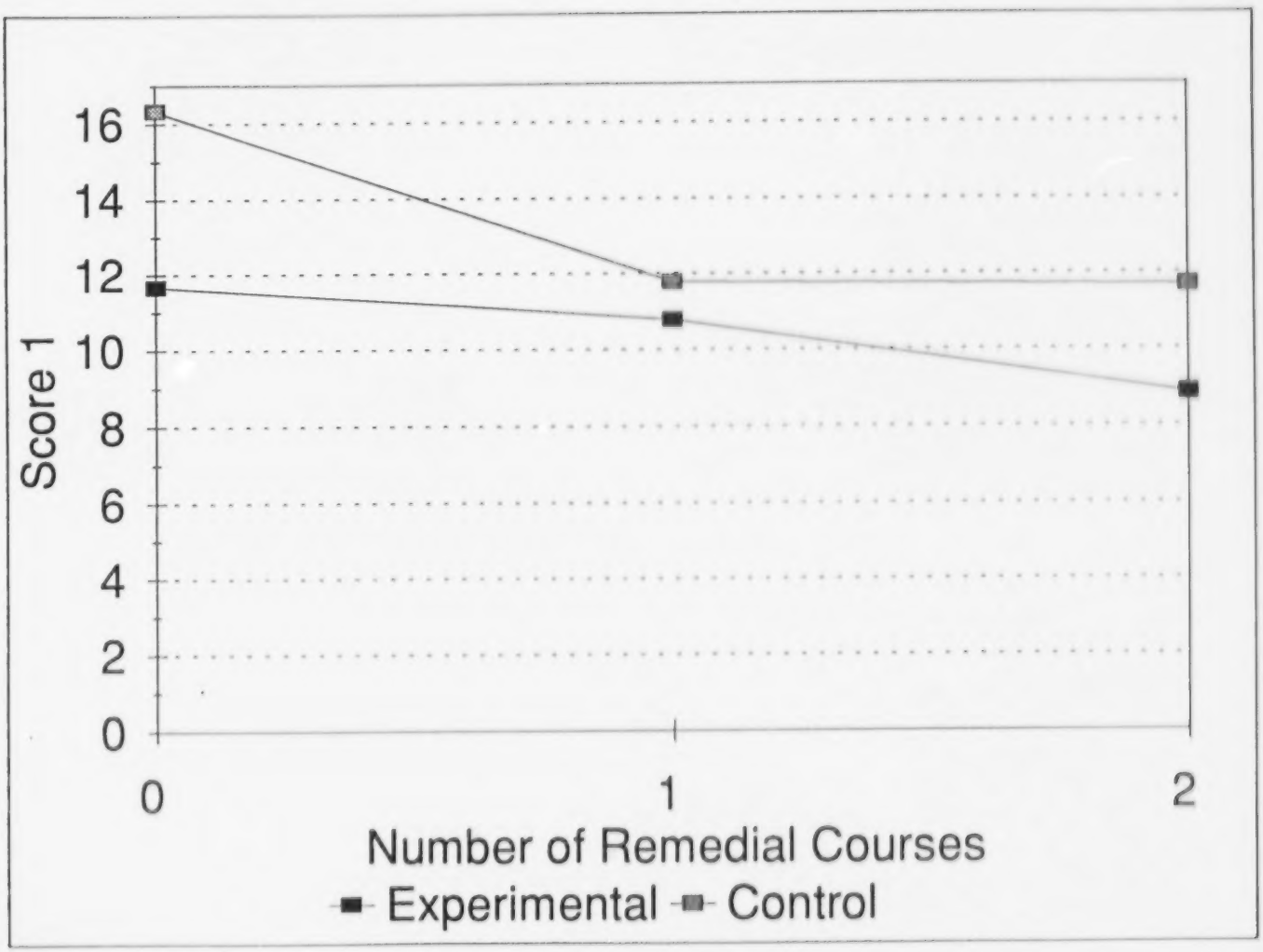
Score Q
Expert
Experienced
Fairly Capable
Beginner
Not Interested
Experience With Computers
Experimental
Control

Means for Different Levels of Remedial Coursework
by Experimental and Control Groups

Remedial Courses	Score 1		Score 2		Score Q		Cell Sizes	
	Experimental	Control	Experimental	Control	Experimental	Control	Experimental	Control
0	11.67	..	16.33	..	16.67	..	3	0
1	10.78	13.00	11.78	11.88	12.08	2.31	36	26
2	8.85	8.30	11.68	9.40	7.09	10.95	34	20

Analysis of Variance	F	Sig of F	F	Sig of F	F	Sig of F
Remedial Courses	1.09	0.30	0.97	0.33	11.61	0.01
Experimental Group	4.84	0.01	1.28	0.28	1.98	0.14
Interaction: Rem x Exp	1.89	0.17	1.09	0.30	34.89	0.01
Total Explained by Model	3.16	0.02	1.56	0.34	12.61	0.01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Score 1
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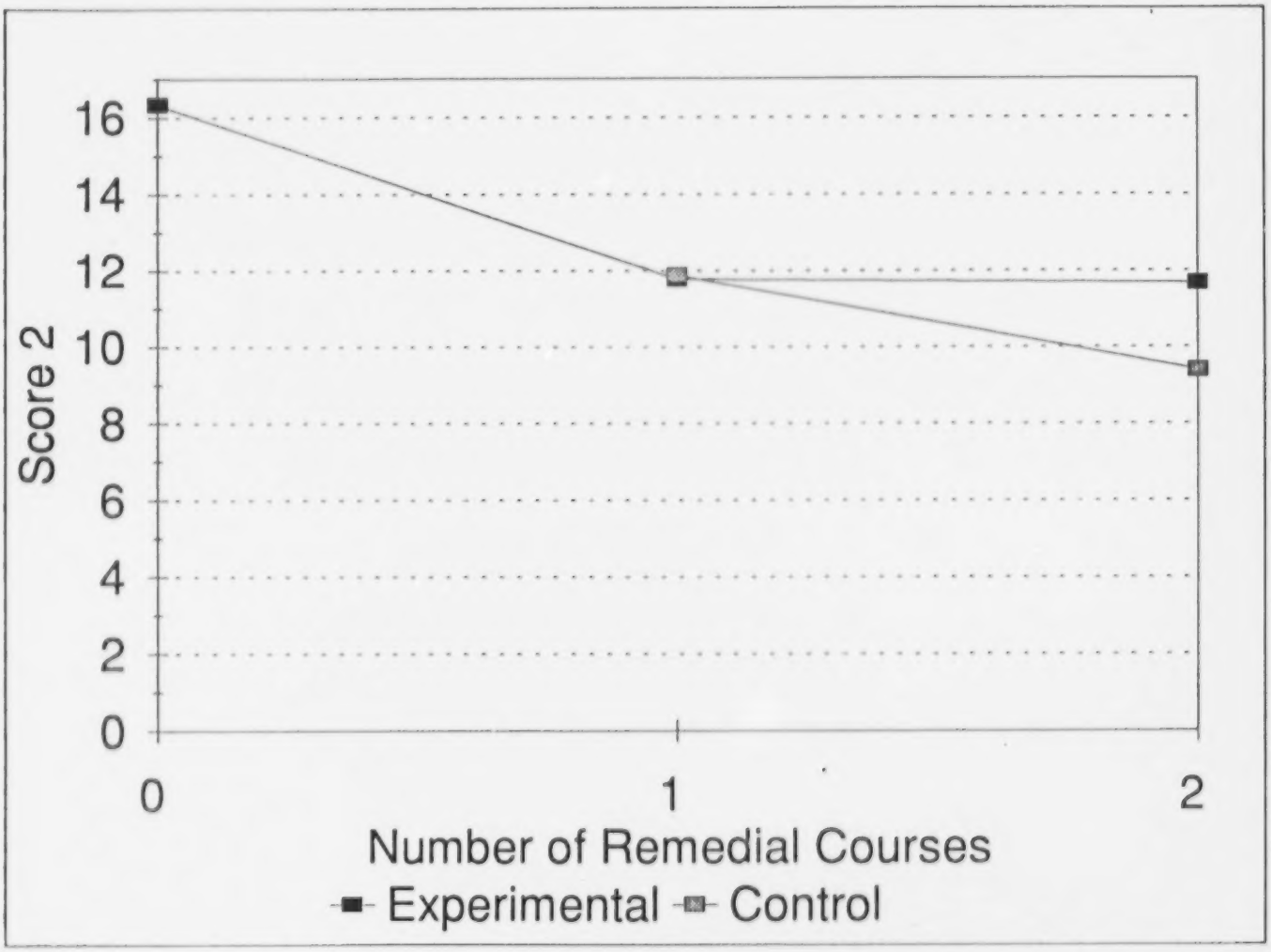
2
Number of Remedial Courses
Experimental
Control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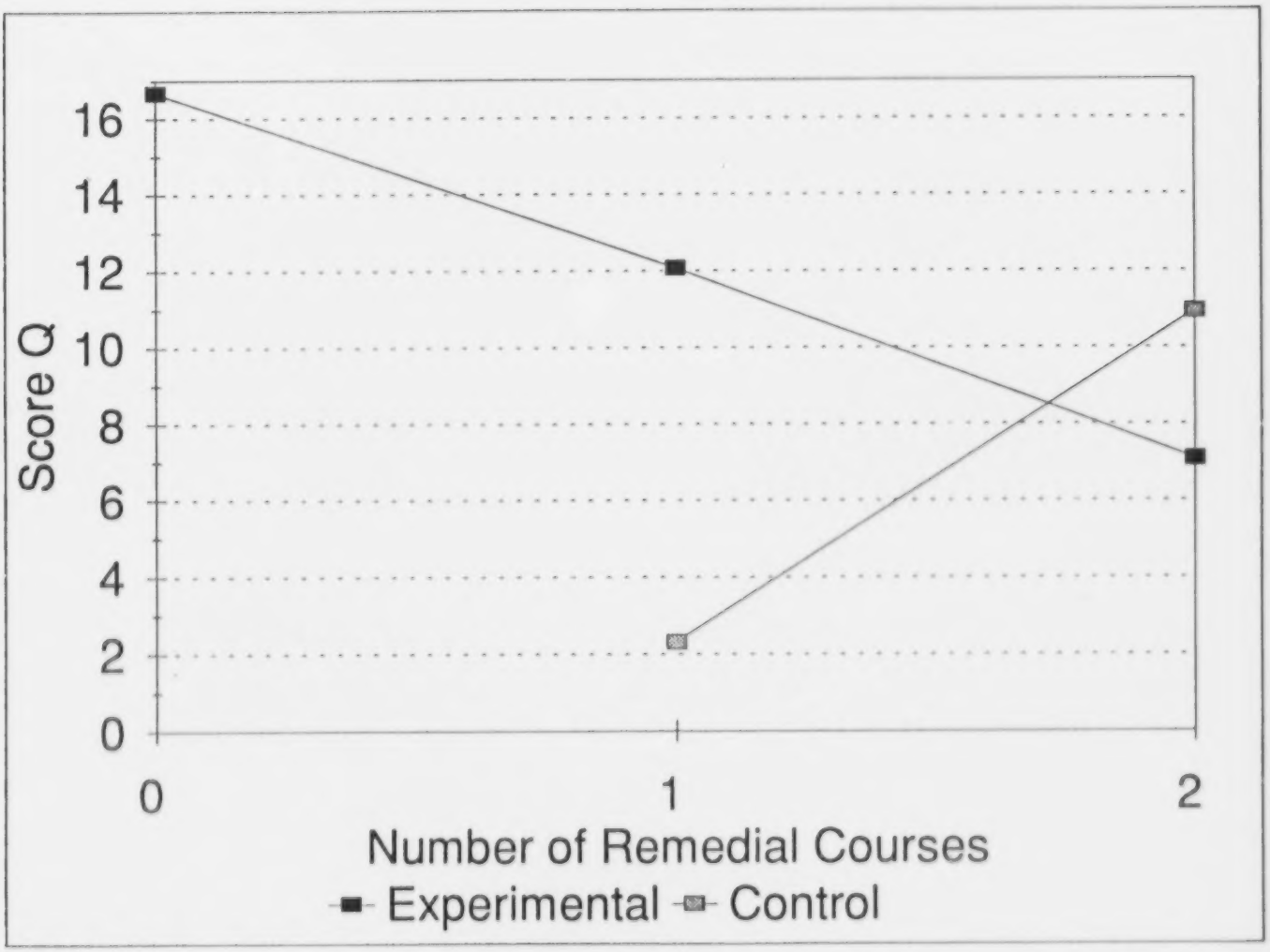
Number of Remedial Courses
Experimental
Control


Score Q
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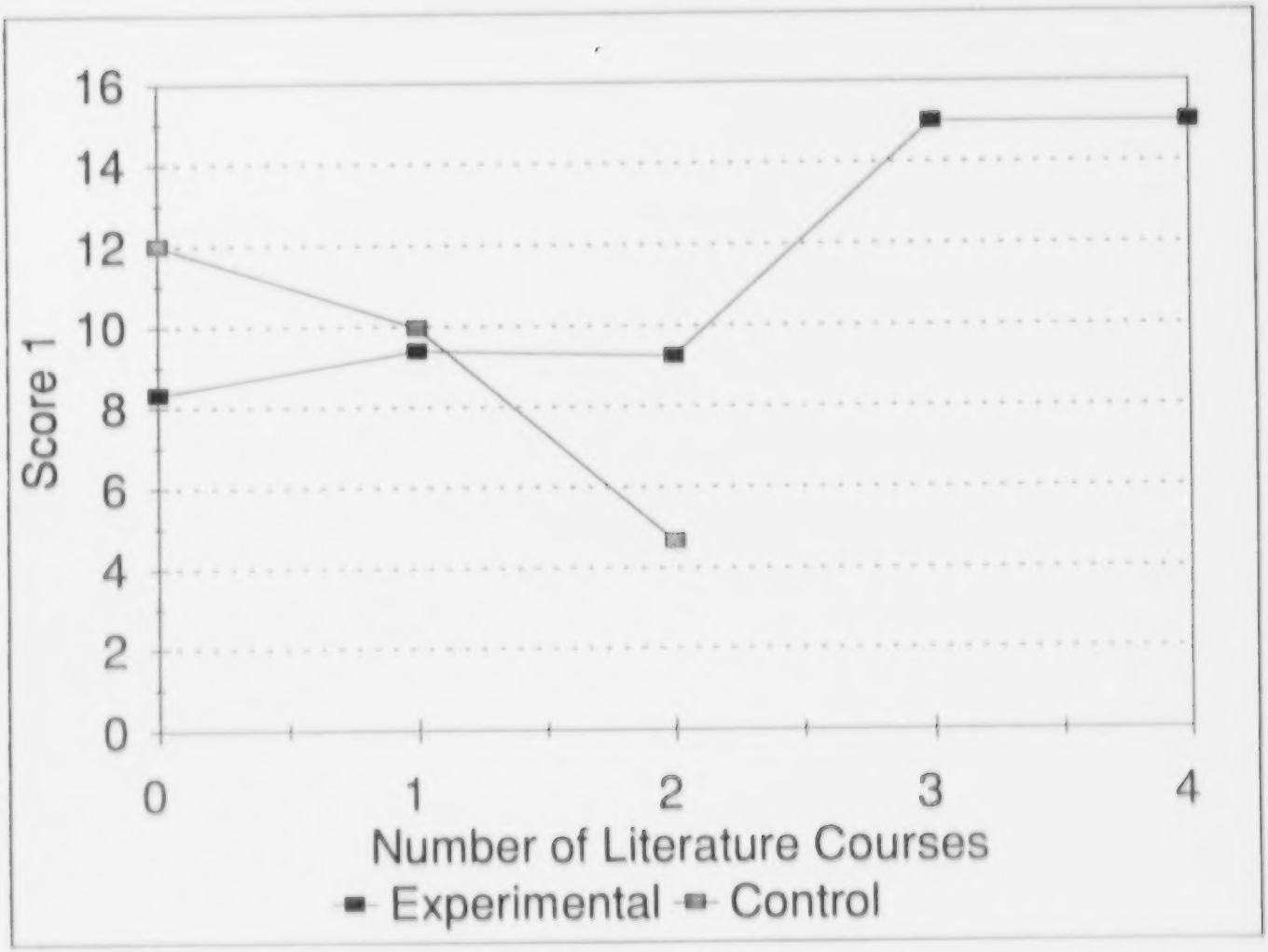
2
Number of Remedial Courses
Experimental
Control

Means for Different Levels of Literature Courses by Experimental and Control Groups

Literature Courses	Score 1		Score 2		Score Q		Cell Sizes	
	Experimental	Control	Experimental	Control	Experimental	Control	Experimental	Control
0	8.32	12.00	9.15	10.03	7.44	2.37	62	30
1	9.40	9.96	12.96	9.57	9.72	10.26	25	23
2	9.25	4.67	13.50	12.33	12.50	5.33	8	3
3	15.00	..	8.00	..	0.00	..	2	0
4	15.00	..	17.00	..	12.00	..	1	0

Analysis of Variance	F	Sig of F	F	Sig of F	F	Sig of F
Literature Courses	4.19	0.04	0.27	0.61	5.30	0.02
Experimental Group	1.12	0.35	1.60	0.18	5.28	0.01
Interaction: Exp x Lit	2.90	0.06	1.62	0.20	3.10	0.05
Total Explained by Model	2.06	0.05	1.42	0.20	4.66	0.01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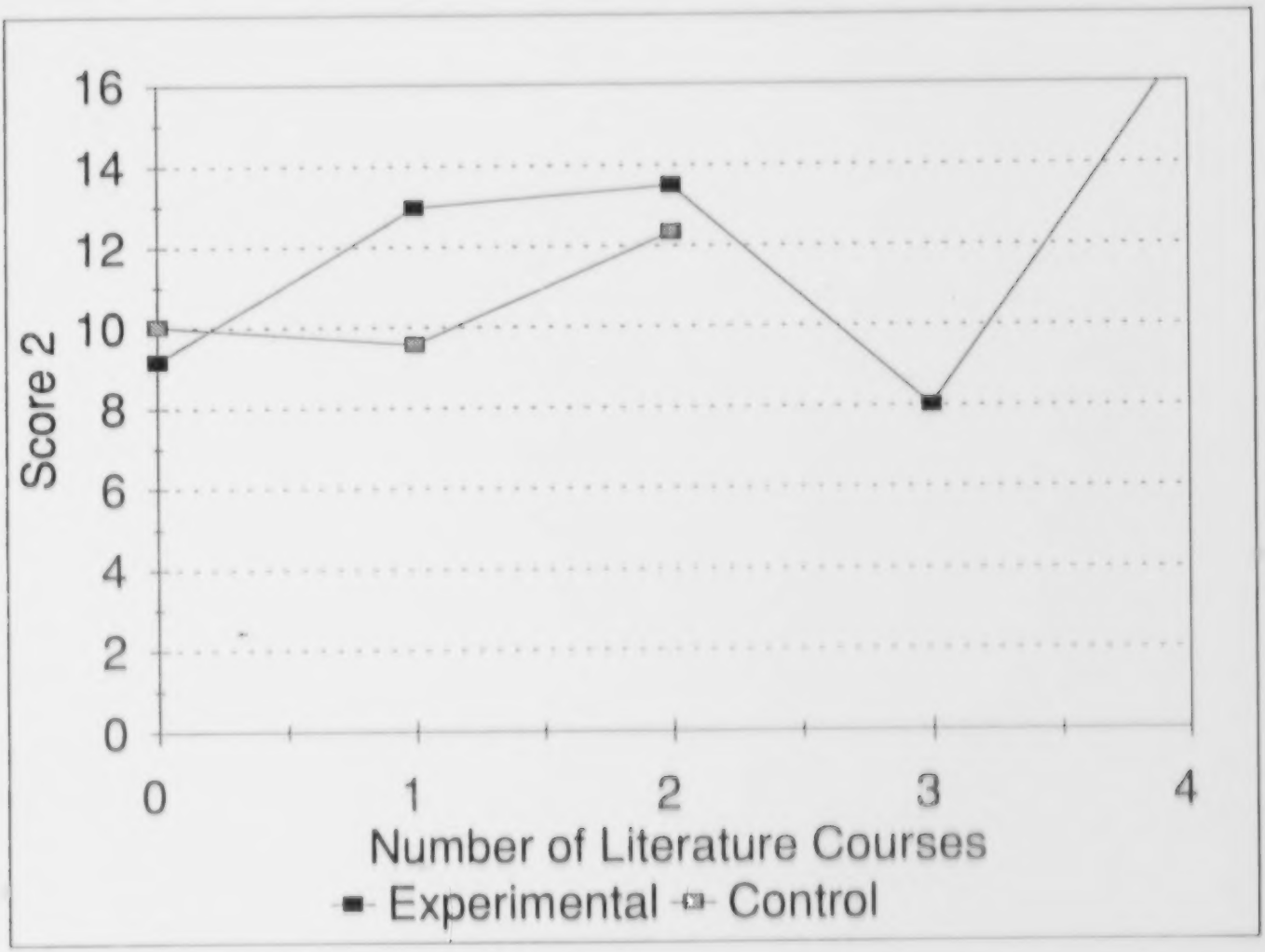
Number of Literature Courses
Experimental
Control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Score 2
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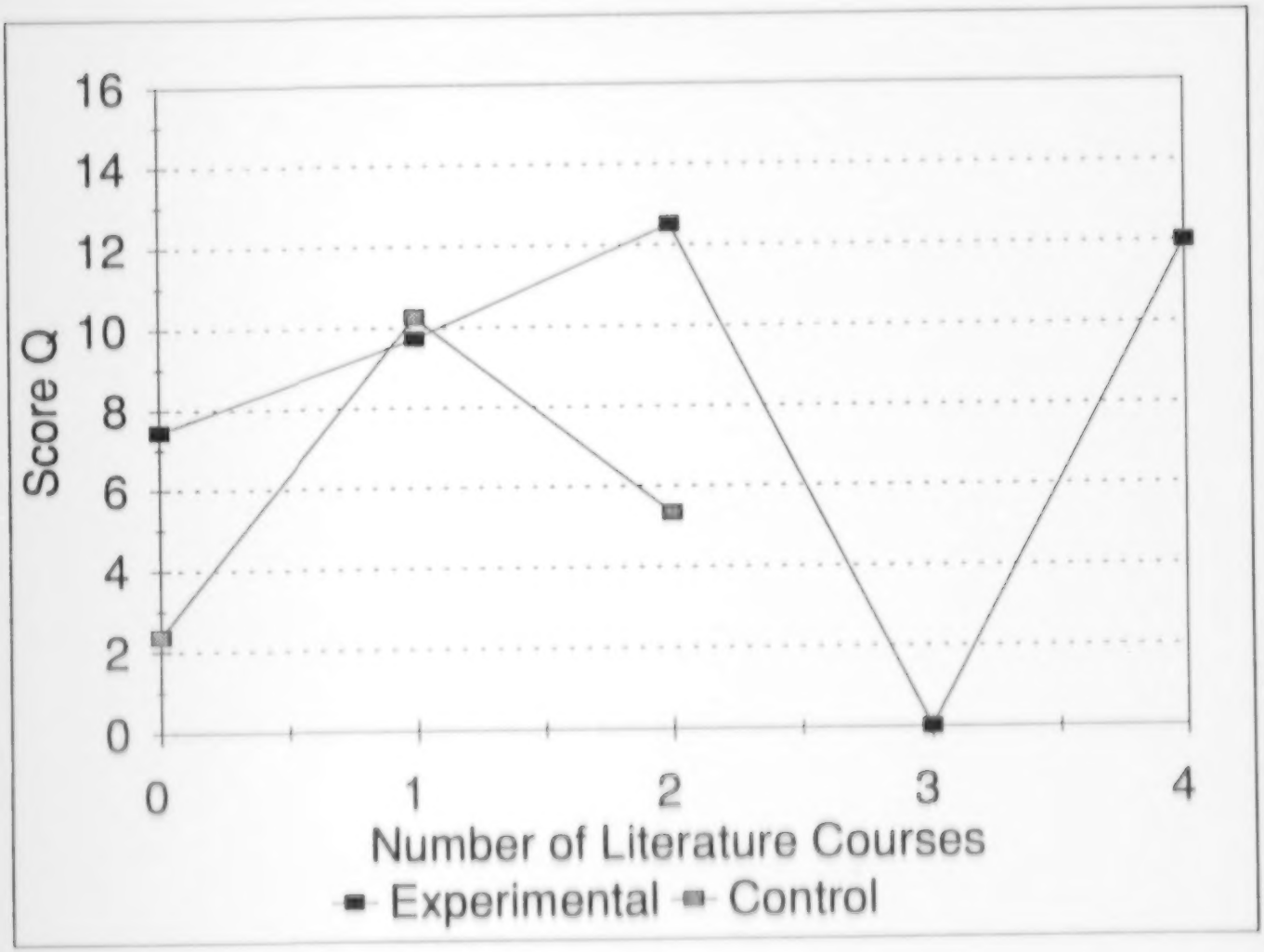
Number of Literature Courses
Experimental
Control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4
2
0
Score Q
0
1
2
3
4
Number of Literature Courses
Experimental
Control

SPRING 1995

Average Reader Ratings

	N	Pretest	Posttest	Difference
Experimental	22	1.64	2.59	0.95
Control	24	1.60	2.43	0.83

	N	Pretest	Posttest	Difference
Had Remedial Courses	25	1.56	2.36	0.80
No Remedial Courses	18	1.72	2.78	1.06

	N	Pretest	Posttest	Difference
Had Literature Courses	3	1.66	2.59	0.93
No Literature Courses	40	1.63	2.51	0.88

Reading Outside of Class	N	Pretest	Posttest	Difference
5 (A lot)	9	1.94	2.67	0.73
4	13	1.58	2.35	0.77
3	14	1.61	2.71	1.10
2	5	1.20	2.00	0.80
1 (None)	0	..	..	..

Reading Poetry for Pleasure	N	Pretest	Posttest	Difference
5 (A lot)	0	..	..	..
4	1	3.00	3.00	0.00
3	9	1.72	2.44	0.72
2	20	1.65	2.68	1.03
1 (None)	10	1.30	2.15	0.85

Computer Competence	N	Pretest	Posttest	Difference
5 (Expert)	1	3.00	3.00	0.00
4	4	1.25	2.00	0.75
3	5	1.30	2.70	1.40
2	7	1.93	2.78	0.85
1 (Not introduced)	0	..	..	..

Appendix C

Student Questionnaires

QUESTIONNAIRE: FIPSE Poetry Project

Please assist us by answering the following questions to the best of your ability. If you need help with any item, please consult your instructor.

Last Name _____ (1) First Name _____ (2)

Soc. Sec. No. _ _ _ - _ _ - _ _ _ _ (3) Date of Birth _____ (4)

College you are now attending _____ (5) Major _____ (6)

How many college credits will you have at the end of this semester? _____ (7)

Please list below the required English courses you have already taken. Include remedial courses, but not literature courses.

Course Number	Title or Description

(8-14)

Please list below all literature and advanced English courses you have taken.

Course Number	Title or Description

(15-21)

(Continued on the other side.)

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QUESTIONNAIRE: FIPSE Poetry Project (continued)

How much do you read for pleasure on a regular basis? (23)

A great deal every day __ (a) A moderate amount every day __ (b)

A moderate amount several times a week __ (c) Very little __ (d) Not at all __ (e)

How much **poetry** do you read for pleasure on a regular basis? (24)

A great deal every day __ (a) A moderate amount every day __ (b)

A moderate amount several times a week __ (c) Very little __ (d) Not at all __ (e)

Do you spend time on creative writing on a regular basis? Yes __ (25) No __ (26)

If you answered 'yes,' indicate below what you have written. Check all that apply. (27)

Short Story __ (a) Novel __ (b) Poetry __ (c) Play __ (d) Literary Criticism __ (e) Essay __ (f)

Other __ (g) Please Describe: _____ (h)

QUESTIONNAIRE: FIPSE Poetry Project

Please assist us by answering the following questions to the best of your ability. If you need help with any item, please consult your instructor.

Last Name _____ (1) First Name _____ (2)

Soc. Sec. No. _ _ _ - _ _ - _ _ _ _ (3) Date of Birth _____ (4)

College you are now attending _____ (5) Major _____ (6)

How many college credits will you have at the end of this semester? _____ (7)

Please list below the required English courses you have already taken. Include remedial courses, but not literature courses.

Course Number	Title or Description

(8-14)

Please list below all literature and advanced English courses you have taken.

Course Number	Title or Description

(15-21)

(Continued on the other side.)

QUESTIONNAIRE: FIPSE Poetry Project (continued)

How do you regard yourself as a computer user? (22)

Expert __ (a) Experienced __ (b) Fairly Capable __ (c) Beginner __ (d) Not Interested __ (e)

How much do you read for pleasure on a regular basis? (23)

A great deal every day __ (a) A moderate amount every day __ (b)

A moderate amount several times a week __ (c) Very little __ (d) Not at all __ (e)

How much **poetry** do you read for pleasure on a regular basis? (24)

A great deal every day __ (a) A moderate amount every day __ (b)

A moderate amount several times a week __ (c) Very little __ (d) Not at all __ (e)

Do you spend time on creative writing on a regular basis? Yes __ (25) No __ (26)

If you answered 'yes,' indicate below what you have written? Check all that apply. (27)

Short Story __ (a) Novel __ (b) Poetry __ (c) Play __ (d) Literary Criticism __ (e) Essay __ (f)

Other __ (g) Please Describe: _____ (h)

Date_____

Poetry Project Follow-up

You can be a great help to us as we work on improving our poetry software by offering your comments, suggestions, and criticism. Please take a few minutes to answer the following questions:

1. Were the instructions within the program clear? If there were problems, please describe them.

2. Do you feel that you learned

____ (a) a great deal about the poem
____ (b) some information about the poem
____ (c) nothing about the poem

3. Do you feel that you learned

____ (a) some information about poetry in general
____ (b) a little bit about poetry
____ (c) no information about poetry in general

4. What did you like best about the program?

5. What suggestions for improvement would you make? More information? Less information? Fewer questions. More questions? Different kinds of questions? (Explain) Different kinds of graphics? Different instructions?

6. If you have used both "Design" and "Musée des Beaux Arts," did you prefer one to the other? If so, which one did you prefer and why?

Appendix D

Report by Dr. Mohamed Tazari

Formative Evaluation of the Kingsborough Multimedia Poetry Project

by

Dr. Mohamed Tazari

The objective of this report is to document the review process of the poetry software application conducted during the summer session of 1995 as part of the formative evaluation process. The poetry software application was used in conjunction with the English Literature course at KBCC. Phase I consisted of a review of the application with the design team. During this session the main features and characteristics of the application were discussed including the intended objectives. After reviewing the application in light of its educational objectives, few recommendations were proposed to insure comprehensibility and flexibility of the interface. Phase II on the other hand consisted of observing students using the application in its intended instructional setting. A particular focus was on observing and documenting the interactive process between the learners and the multimedia instructional tool. Problems closely related to comprehensibility and flexibility of and access to the tools were identified, recorded and analyzed. Feedback from the students elaborating on such problems constituted the basis for proposing and recommending fundamental modification and reshaping of certain

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instructional features and technical design elements so that the application meets the learning needs of the target audience.

Phase I: Preliminary Review of The Application and Discussion with The Design Team

In light of the discussion on the educational objectives of the instructional tools of the application with the design team and after conducting a preliminary review, the following recommendations were proposed:

The help element of the instructional tool which explains the use and the objective of the various features should be made available at all times from within the main instructional menu.

In the version of the software that was initially reviewed during this phase, the help feature was available only at the opening menu. Reading and learning about the use and the capabilities of the various features of the application before seeing the layout of the main instructional menu and experimenting with the capabilities of the features can be very confusing for the learners for the following reasons:

1) learners have no visual representation of what they are reading

2) by the time they reach the main menu they have already forgotten what they have read

3) once in the main instructional menu they can not access the help feature as and when they need it

This recommendation was integrated in the newer version of the application used by the students. This design modification ~~student~~c provided students with the ability to request help about the various features as they engaged with the instructional tool.

The Gallery component should be accessed not only independently as it is the case in the current version but also from within the poem

The Gallery component of the application contains a collection of images which inspired the author of the poem. The purpose of this component is to provide students with access to the art work that inspired the poet and influenced both the content and form of the poem under examination. This feature allows the students to appreciate the visual context that influenced the ideas of the poem.

The rational is that the contextual links and access to the Gallery from within the poem should be provided so that

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the students can access not only the primary sources influencing the creative process in writing the poem but also they should be able to refer to these sources in context while interacting with the poem to gain a deeper appreciation of its meaning and capitalize on the benefits of the hypermedia capabilities of the instructional tools.

Phase II: Observation of the Use of the Application by the Students At the Instructional Laboratory

The use of the application by the students at the instructional laboratory was observed during two consecutive days. Students used the application to perform the following tasks: 1) acclimate themselves with the instructional tool, 2) experiment with and use the various interactive features to conduct on-line research on and analysis of the poem and 3) on-line composition and editing of responses to the various essay questions.

At the beginning of each session, each student was given his or her own individual diskette to store the on-line responses to the various essay questions. Directions on how to access both the network and the software application were written on the board. After accessing the application students were instructed to explore its many features and respond to as many essay questions as they can and / or desire.

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While students were engaged with the application, this researcher observed individual or group of students interacting with it without ever interfering with the learning process and took notes of the various design features and elements that the students seemed to find confusing in terms of comprehensibility, flexibility and ease of use of the instructional tool. Whenever students seemed to be experiencing a problem, the nature of such a problem was identified, recorded and analyzed. At the end of each session, students were asked to reflect on their learning experience with the application and express in their own words what they liked about the application as well as the type of problems and difficulties they encountered while using the application.

The analysis of the data sources composed of 1) this researcher's observations and 2) students' reactions to their learning experience with the application revealed the following findings which were reported to the design team after each session and informed the recommendations for improvement which were proposed.

The following design elements were identified and were categorized as being confusing for the learner since they require additional time and effort on tasks that do not support the learning process and could even inhibit or prevent learning.

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Students had to drag the mouse in all directions over the text to locate parts of the text that contain additional information.

Recommendation: Any part of the text that contains additional information should be highlighted in a specific color.

Action: The highlighting feature was integrated in the last version of the application.

Outcome: Students did not waste time looking for and finding parts of the text with additional information. Instead, they used that time to remain focused on supporting their comprehension needs by immediatly accessing and consulting additional information if it exits when and if needed.

When students clicked on any part of the text containing additional information, it was not clear how to close the field containing the new information. Only clicking on Poem would close the opened field.

Recommendation: Clicking outside the opened field would immediatly close the field.

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Action: This modification was integrated in the last version of the application

Outcome: Students did waste time trying to close the opened field to carry on their activities. Instead, they used that time to remain focused on the task at hand and process the information they have just read or consulted.

While in the process of composing or editing responses, students had to save and close their work first before they are able to 1) verify or confirm their understanding and 2) support their writing process by consulting the poem or additional information.

Recommendation: Students should be able to continue their research even while in the process of writing. Indeed, they should be able to write, read and consult various types of documents simultaneously.

Action: This recommendation requires more time to implement.

Outcome: Students will not forget why they wanted to read or consult other types of documents in the first place

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and will avoid ending up engaging in another type of research activity not closely related to the one they were working on.

The software review conducted by this researcher as part of the formative evaluation process isolated only those design elements that would have prevented the application from achieving its intended educational objectives had they not been identified. The reason why each design element was not accomplishing the objectives sought were discussed and solutions were provided. The integration of the recommendations outlined throughout this report would provide a more appealing, comprehensible, accessible and responsive interface and would enhance the effectiveness of the learning experience.

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Appendix E

Grid used for Programming

Interpretations of "Design" are followed by the grid used to categorize answers

Overall Interpretations of "Design"

1. The poet is not sure if the scene was designed or random.

2. The scene is ugly because it is a scene of death, but still there is good (nature operating as it must) and beauty (the white design) in it.

3. However the scene appears, that's the way nature works.

4. An evil power designed this scene of sickness and death.

5. Frost creates his own design (the poem) through his description of the scene and this is what the poem is basically about.

6. If there is no designer, the situation is worse than if the designer is evil: the world operates at random.

7. The poet views the natural world objectively and dispassionately and does not offer an interpretation of the scene.

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• = fits interpretation
X = cannot fit interpretation
0 = neutral or irrelevant

Qu	Cat	Answer	I 1 Doubt	N 2 Optimism	T 3 That's life	E 4 evil/ Depressio	R 5 Literature	P 6 Random/ depressive	S 7 objective/ neutral
2	1	3 together							
	2	all white							
	3	opposites							
	4	crazy							
	5	all small							
	6	spiders height							
3	1	killing							
	2	survival of fittest							
	3	formed a design							
5	1	playing a role							
	2	ecology							
	3	symbols							
	4	players in game							
	5	almost human							
	6	poet's characters							
15	1	Ritual, ceremony							
	2	normal spiders breakfast							
	3	like breakfast							
	4	whatever is is Right							
	5	typical - that's nature							
	6	magic							
	7	irony							

what is unusual about the scene?

what just happened?

why are they referred to as 'characters'?

How can they be 'beginning the morning Right'?

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	Qu	Cat	Answer	I 1 Doubt	N 2 Optimism	T 3 That's life	E 4 evil/ Depressio	R 5 Literature	P 6 random depression	S 7 objective neutral
Is the picture ugly, beautiful both or neither?	16	1	ugly							
		2	depressing							
		3	beautiful							
		4	fascinating, strange							
		5	both; paradox							
		6	neither: nature							
Who is the designer?	21	1	God							
		2	Satan/evil power							
		3	supernatural							
		4	fate							
		5	spider							
		6	nature							
		7	poet							
If design does govern, what does that say about designer?	22	1	indifferent							
		2	evil							
		3	in control							
		4	victimizer (we are prisms)							
If no designer, how does world operate?	24	1	chance/random							
		2	chaos							
		3	survival of fittest							
		4	every man for himself							
		5	humans in control: masters of our fate							
Does design govern? (according to those)	25	1	yes							
		2	no							
		3	not sure							

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Appendix F

Print-outs of Student Sessions

Logs of one student's work on "Musee des Beaux Arts"

[The students' initial interpretation before going through the program.]

This is a poem about the difference between art and ordinary life. The 'Old Masters' understand what is unique about life. THEY understand that suffering is a part of life. There is nothing unique about it. The aged sitand wait for something to occur, and children dont care one way or the other. Poets never forget thst while dreadful/glorious things might happen at the same time.

In the second stanza Auden gives an illustration of what he means. Daedalus and Icarus are flying over the sea, an incredible event, beyond all human comprehension. Icarus flies close to the sun and burns his wings falling into the sea. The ploughman must have heard the splash, but it meant nothing to him. What is important to him is the rainfall, the amount of sunlight his crops will get. The rich people on the ship actually the boy go into the sea, but they went on their way too busy to stop.

[The chronological log, which we use to see how the student uses the program, including both answers to questions and hotwords consulted. The latter are enclosed in brackets.]

Musée des Beaux Arts: Log of Current Session
The session began: Oct 17 1995 09:47 AM

Student's Name: eugene manni
Course and Section: ENG 42do1b

[Masters]
[birth]
[martyrdom]
[Icarus]
[cry]

The program was left to be finished later.

The session ended: Oct 17 1995 10:18 AM

Continuation of Session

The session resumed: Oct 24 1995 09:34 AM

Question 1: What seems to be the subject of the painting by Bruegel, "Landscape with Fall of Icarus?" (1)

Answer:
icarus falling from the sky into the sea while others aregoing about their business.

Question 2: Why do you think that Bruegel has not made Icarus obviously the center of attraction in the painting? (1)

Answer:
THE SUBJECT OF THE PAINTING IS NOT THE FALL OF ICARUS, BUT WHAT IS HAPPENING WHILE ICARUS IS FALLING. THE PLOUGHMAN IS PLOUGHING AND THE SHIP IS GOING ABOUT ITS BUSINESS.

Question 3A: What is the difference between Ovid's account of these characters and the way Bruegel depicts them? (1)

Answer:
in OVID there is a detail account of how people reacted to ICARUS' FALL.

Question 4: How does Auden describe how the characters in the painting respond to Icarus' fall? (1)

Answer:
they ignore it. they go on about their business.

Question 5: Why does he say that the fall of Icarus is "not an important failure" for the ploughman? (1)

Answer:
AN important failure for the ploughman would be if the sun didn't shine tomorrow , or if there was a drought so that he couldn,t feed his family. Someone falling out of the sky doesn't put food on the table.

Question 6: What does the fact that the ship is "expensive" and "delicate" have to do with its reaction to Icarus' fall? (1)

Answer:
The words 'expensive' and ' delicate' give the connotation of a group of rich pampered individuals out for a day on their boats, away from the problems of the office or of the world drinking concerned with having a good time. they probably saw something, and on another day might have been interested by today, they have somewhere to go.

Question 7: How would you respond if you saw "a boy falling out of the sky?" If you saw a more common accident, would you react the same way? (1)

Answer:
In all probability I would react as those on board the ship did.

Question 8: What figures mentioned in the first part of the poem seem to exhibit the same kind of reaction to events as those in the second part of the poem (lines 14 to 21)? (1)

Answer:
Children, horses an dogs.

Question 9: What do the miraculous birth, the dreadful martyrdom and the fall of Icarus have in common OTHER than the fact that to some extent they go unnoticed? (1)

Answer:
All thses events are beyond the normal, everyday events one lives through. They involve ideas, emotions beyond the ordinary.

Question 10: Why do you think that Auden follows his introductory statements about suffering with the picture of the "miraculous birth," rather than the painting of the "dreadful martyrdom?" (1)

Answer:
In a series birth comes first and builds to the climax of 'the dreadful martyrdom'.

Question 11: What is the part played by the non-human world (the horse, the dog, the sun) in the miraculous or tragic events recounted in the poem? (1)

Answer:
All these are either inanimate or nonrational things. Unlike humans they can not comprehend the significance of what Daedalus has done or what Icarus has done. these go on regardless of what happens about them.

Question 12: Auden says that the Old Masters were never wrong about suffering, because they understood its "human position." What does he mean by "human position?" (1)

Answer:
To be human is to suffer. The poet knows that suffering is part of life, and no amount of feeling, lovecan change that. Nothing can keep us from dying, getting sick or being hurt.

Question 13: Are Auden and Bruegel saying the same thing? (1)

Answer:
yes

Question 13: Are Auden and Bruegel saying the same thing? (2)

Answer:
yes

Question 13A: What are Auden and Bruegel both saying? (1)

Answer:
Suffering is a part of life. The poet and the artist differ from the writer of sentimental cards in understanding life.

Question 14: In what way may the meaning of the poem have been influenced by the events that were taking place in Europe at the time Auden wrote it? (1)

Answer:
In 1938,

The program was left to be finished later.

The session ended: Oct 24 1995 10:17 AM

Continuation of Session

The session resumed: Oct 31 1995 09:31 AM

Question 14: In what way may the meaning of the poem have been influenced by the events that were taking place in Europe at the time Auden wrote it? (2)

Answer:
In 1938 , Hitler was in power in Germany and the world was close to war. Auden had left England to live in America so that as a writer he could continue to produce poems. The artist must go on with his work regardlesss of what is happening in the world

Question on Interpretation:

Now that you have answered the questions, please write a short interpretation of the poem as a whole. Then, show to what extent the allusions in the poem helped communicate its meaning.

Answer:
The poems is intwo stanzas. The first stanza makes a makes a general statement and the second gives an example. The artist /poet knows a fundamental truth about life- in life there is suffering regardless of who you are or how good or bad , rich or poor you are. In the first quartrain, Auden calls artist/poet 'Old Masters'. In the second quartrain, Auden gives the reaction of two different groups to human suffering. The 'aged' having lived through suffering are wainting for the 'miraculous birth' that will end suffering and bring in peace and love and rebirth, while children who have never sen or endurd suuffering don't particularly want any kind of change.The third quartrain brings back the 'Old Masters' and relates tem to children, horses and dogs as going about their business not involved in the disasters of the world. The tone of the poem , the choice of words are all unemotional. the second stanza is an example of Auden's theme. He takes Brueghel's "Icarus" as his example. In the painting we see only the leg of Icarus . The rest of him is in the sea. We see a ploughman working his field , and a ship sailing somewhere. They ignore Icarus' plight. They ignore his 'forsaken cry'. The ploughman had a family to worry about and the e had somewhere to go. sailing 'calmly on'.

Program completed.

The session ended: Oct 31 1995 10:05 AM

[The log which is printed out for the students, arranged by question and recording all answers to the questions attempted. A copy of the student's final interpretation is provided on a separate sheet.]

Student's Name: eugene manni
Course and Section: ENG 42do1b

"Musée des Beaux Arts": Student Log--Oct 17 1995 09:47 AM

Question 1+ What seems to be the subject of the painting by Bruegel, "Landscape with Fall of Icarus?"

Answer 1: icarus falling from the sky into the sea while others aregoing about their business. +

Question 2+ Why do you think that Bruegel has not made Icarus obviously the center of attraction in the painting?

Answer 1: THE SUBJECT OF THE PAINTING IS NOT THE FALL OF ICARUS, BUT WHAT IS HAPPENING WHILE ICARUS IS FALLING. THE PLOUGHMAN IS PLOUGHING AND THE SHIP IS GOING ABOUT ITS BUSINESS. +

Question 3+ What human characters from Ovid's account of the fall of Icarus are included in Bruegel's painting (aside from Icarus himself)?
+

Question 3A+ What is the difference between Ovid's account of these characters and the way Bruegel depicts them?

Answer 1: in OVID there is a detail account of how people reacted to ICARUS' FALL. +

Question 4+ How does Auden describe how the characters in the painting respond to Icarus' fall?

Answer 1: they ignore it. they go on about their business. +

Question 5+ Why does he say that the fall of Icarus is "not an important failure" for the ploughman?

Answer 1: AN important failure for the ploughman would be if the sun didn't shine tomorrow , or if there was a drought so that he couldn;t feed his family. Someone falling out of the sky doesn't put food on the table. +

Question 6+ What does the fact that the ship is "expensive" and "delicate" have to do with its reaction to Icarus' fall?

Answer 1: The words 'expensive' and ' delicate' give the connotation of a group of rich pampered individuals out for a day on their boats, away from the problems of the office or of the world drinking concerned with having a good time. they probably saw something, and on another day might have been interested by today, they have somewhere to go. +

Question 7+ How would you respond if you saw "a boy falling out of the sky?" If you saw a more common accident, would you react the same way?

Answer 1: In all probability I would react as those on board the ship did. +

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Answer 1: In a series birth comes first and builds to the climax of 'the dreadful martyrdom'. +

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Answer 1: To be human is to suffer. The poet knows that suffering is part of life, and no amount of feeling, lovecan change that. Nothing can keep us from dying, getting sick or being hurt. +

Question 13+ Are Auden and Bruegel saying the same thing?

Answer 1: yes

Answer 2: yes +

Question 13A+ How do Auden and Bruegel differ?

Answer 1: Suffering is a part of life. The poet and the artist differ from the writer of sentimental cards in understanding life. +

Question 14+ In what way may the meaning of the poem have been influenced by the events that were taking place in Europe at the time Auden wrote it?

Answer 1: In 1938,

Answer 2: In 1938 , Hitler was in power in Germany and the world was close to war. Auden had left England to live in America so that as a writer he could continue to produce poems. The artist must go on with his work regardlesss of what is happening in the world +

Appendix G

Conference Program

Computers and the Humanities

a conference sponsored by FIPSE and Kingsborough Community College, May 12, 1995

Plenary Session - MAC Conference Center

9:30 a.m.
Registration and Coffee

10 a.m.
Introductory remarks (Yvonne Stam)
Greetings from KCC Dean Thelma Malle

10:15 a.m.
Keynote Address: ***Bret Eynon*** - "Hype, Hope, and Hard Questions: Realizing the Promise of the Media Classroom"

Morning Presentations

11:- 11:40 a.m.
Paula Berggren and David Stephan: "The Experience of Pilgrimage through Literature and the Humanities - the Prologue to Chaucer's *Canterbury Tales*" **Rm S225**

Mahmoud Hassan: "Elementary Computer-Aided Design Using *Autosketch* 3.0 - A Hands-On Demonstration" **Rm M118**

11:50 - 12:30
Howard Nimchinsky and Jocelyn Camp: "Exploring Poetry through Interactive Computer Programs - W.H. Auden's *Musée des Beaux Arts*" **Rm S214**

Cindy Greenberg: "Speech Discovery - An Interactive Multimedia Program for ESL Students" **Rm S225**

LUNCH: Conferees are invited to sit in our special waterfront section of the Kingsborough Community College cafeteria.

Afternoon Presentations

1:30 - 2.10 p.m.
Michael L. Gargano: "Using a Genetic Algorithm Approach for Sir Flinders Petrie's Archaeological Seriation Problem" **MAC classroom**

Allan Mirwis: "Ask *CARL* - The Computerized Academic Reference Librarian" **Rm S214**

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Walk-in Demonstrations (continuously through 3 p.m.) featuring: *Who Built America?*, Exploring Poetry, Multimedia for ESL, and Chaucer's *Prologue*

Rm S225

*****

2:20 - 3 p.m.
Denis Sivack: "Cats, Scat and Shards - dBase Fieldwork in Conservation Biology and Archaeology" **MAC classroom**

Jeanne Galvin: "Finding Humanities Resources on the Internet" **Rm S214**

Day's End - MAC Conference Center

3 - 3:30 p.m.
Closing Remarks (Jocelyn Camp)

Appendix H

Software

"Design"

"Musée des Beaux Arts"

"The Windhover"

"Poetry to the Ear" (excerpts)

[Please note: Software will follow under separate cover.]